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10/582,064

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EXAMINER

PRABHAKHER, PRITHAM DAVID

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,064	Applicant(s) KOLEHMAINEN ET AL.	
	Examiner PRITHAM PRABHAKHER	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16,32 and 39-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16,32 and 39-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>03/16/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1.) *Response to Arguments*

Applicant's arguments with respect to claims 16, 32 and 39-42 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.) **Claim 41 is rejected under 35 U.S.C. 102(e) as being anticipated by**

Aratani (US Pub No.: 2003/0086013A1).

*In regard to **Claim 41**, Aratani discloses an imaging device comprising at least two image capturing apparatus (Compound eye image-taking system, **Abstract and Figures 1-4**. Aperture stop member 2 (1-4), optical lens array 3 (1-4), light shielding block 4 (1-4) and optical filter 6 (1-4) make up four image capturing apparatus', **Paragraphs 0024-0028 and Figures 3-4**) and a sensor array configured to produce an electric signal when exposed to light (Sensor array 7 is divided between the four image capturing apparatus', **Figures 3-4 and Paragraphs 0031-0032; 0038**), the sensor array being divided between at least two image capturing apparatus (Looking at **Figure 4**, the*

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*sensor array 7 is divided into section 7-1 to 7-4 which are used to produce an electric signal, **Figure 4 and Paragraph 0031**).*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3.) Claims 39-40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aratani (US Pub No.: 2003/0086013A1) and further in view of Bawolek et al. (US Patent No.: 6825470B1).

*In regard to **Claim 39**, Aratani discloses an imaging device comprising at least two image capturing apparatus (Compound eye image-taking system, **Abstract and Figures 1-4**. Aperture stop member 2 (1-4), optical lens array 3 (1-4), light shielding block 4 (1-4) and optical filter 6 (1-4) make up four image capturing apparatus', **Paragraphs 0024-0028 and Figures 3-4**), each apparatus being arranged to produce an image (Sensor array 7 is divided between the four image capturing apparatus', **Figures 3-4 and Paragraphs 0031-0032; 0038**).*

*Although Aratani discloses that all the image sensors are capable of capturing an image (The image sensor 7 includes a number of image detecting elements (pixels), **Paragraph 0031**), the reference does not explicitly disclose that at least one image capturing apparatus is dedicated for measuring exposure parameters. Bawolek et al. disclose an imaging system that uses an imaging array with four types of pixel sensors. Three color types (RGB) with the fourth being an IR type, **Column 3, Line 23 to Column 4, Line 3 of Bawolek et al.** The IR pixel sensor is used as an exposure parameter to generate an image with correct colors. IR signals from the IR sensor are subtracted from signals generated by sensors responsive to both IR and visible light, **Column 2, Lines 36-46 of Bawolek et al.** It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to enable the fourth image capturing apparatus disclosed by Aratani with the ability to capture an IR image as disclosed by Bawolek et al., because this helps reduce the effect of IR upon an image signal by subtracting signals generated by the IR pixel sensor from the signals generated by pixel sensors responsive to both IR and visible light and this helps in producing an image with a correct color, **Column 1, Lines 21-31 and Column 2, Lines 36-44 of Bawolek et al.***

*Regarding **Claim 40**, Aratani and Bawolek et al. disclose the imaging device of claim 39, comprising at least four image capturing apparatus (**Figure3 of Aratani**), wherein three image capturing apparatus each comprise an unique colour filter from a group of filters red, green or blue or from a group of filters cyan, magenta or yellow*

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*(Three color types (RGB) with the fourth being an IR type, **Column 3, Line 23 to Column 4, Line 3 of Bawolek et al.**).*

*With regard to **Claim 42**, Aratani discloses a method of creating an image file in an imaging device, comprising producing images with at least two image capturing apparatus (Compound eye image-taking system, **Abstract and Figures 1-4**. Aperture stop member 2 (1-4), optical lens array 3 (1-4), light shielding block 4 (1-4) and optical filter 6 (1-4) make up four image capturing apparatus', **Paragraphs 0024-0028 and Figures 3-4**. Sensor array 7 is divided between the four image capturing apparatus' and is used to produce the image, **Figures 3-4 and Paragraphs 0031-0032; 0038**).*

*Although Aratani discloses that all the image sensors are capable of capturing an image (The image sensor 7 includes a number of image detecting elements (pixels), **Paragraph 0031**), the reference does not explicitly disclose using at least one image capturing apparatus only for measuring exposure parameters. Bawolek et al. disclose an imaging system that uses an imaging array with four types of pixel sensors. Three color types (RGB) with the fourth being an IR type, **Column 3, Line 23 to Column 4, Line 3 of Bawolek et al.**. The IR pixel sensor (Channel 4) is only used as an exposure parameter to generate an image with correct colors. IR signals from the IR sensor are subtracted from signals generated by sensors responsive to both IR and visible light, **Column 2, Lines 36-46 of Bawolek et al.**. It would have been obvious and well-known*

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*to one of ordinary skill in the art at the time of the invention to enable the fourth image capturing apparatus disclosed by Aratani with the ability to capture an IR image as disclosed by Bawolek et al., because this helps reduce the effect of IR upon an image signal by subtracting signals generated by the IR pixel sensor from the signals generated by pixel sensors responsive to both IR and visible light and this helps in producing an image with a correct color, **Column 1, Lines 21-31 and Column 2, Lines 36-44 of Bawolek et al.***

4.) Claims 16 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aratani (US Pub No.: 2003/0086013A1) and further in view of Bawolek et al. (US Patent No.: 6825470B1) and in view of Weldy et al. (EP 0858208A1).

*In regard to **Claim 16**, Aratani discloses an imaging device (Compound eye image-taking system, **Abstract and Figures 1-4**) comprising at least four image capturing apparatus (Aperture stop member 2 (1-4), optical lens array 3 (1-4), light shielding block 4 (1-4) and optical filter 6 (1-4) make up four image capturing apparatus', **Paragraphs 0024-0028 and Figures 3-4**) and a sensor array divided between at least four image capturing apparatus (Sensor array 7 is divided between the four image capturing apparatus', **Figures 3-4 and Paragraphs 0031-0032; 0038**), each apparatus*

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*comprising a lens system (microlenses/ optical lens array 3 (1-4), **Figures 3-4**) and a portion of the sensor array configured to produce an electric signal (Looking at **Figure 4**, the sensor array 7 is divided into section 7-1 to 7-4 which are used to produce an electric signal, **Figure 4 and Paragraph 0031**), each apparatus being arranged to produce an image comprising pixels (The image sensor 7 includes a number of image detecting elements (pixels), **Paragraph 0031**), the device further comprising a processor operationally connected to the sensor arrays (Processing circuit 9 is operationally connected to the sensor arrays 7 and resides on the same substrate, **Paragraphs 0031-0034, 0073; Figures 3-4**) and configured to produce an image proportional to the electrical signal received from the sensor arrays (**Paragraph 0034**),*

*and the device comprises a processor configured to combine at least a portion of the images with each other (The images taken by the image sensors are combined with each other, **Paragraphs 0048 to 0064**).*

*Aratani discloses that three image capturing apparatus being configured to produce an image (Three of the image capturing apparatus' are capable of producing an image, **Paragraphs 0034-0036**). However, Aratani does not explicitly disclose that the three images captured are color images. Official notice is taken by the examiner on stating that it would have been obvious to enable the three image capturing apparatus' disclosed by Aratani with the ability to capture color images. It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to enable the image capturing apparatus' discussed by Aratani with the ability to capture color*

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images, because color images help people to relate to the images in an improved way since people for the most part view their surroundings in color.

*Although Aratani discloses the fourth image capturing device as discussed above, the reference does not explicitly disclose that the fourth image capturing apparatus is configured to produce an infra-red image. Bawolek et al. disclose an imaging system that uses an imaging array with four types of pixel sensors. Three color types (RGB) with the fourth being an IR type, **Column 3, Line 23 to Column 4, Line 3 of Bawolek et al.** It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to enable the fourth image capturing apparatus disclosed by Aratani with the ability to capture an IR image as disclosed by Bawolek et al., because this helps reduce the effect of IR upon an image signal by subtracting signals generated by the IR pixel sensor from the signals generated by pixel sensors responsive to both IR and visible light and this helps in producing an image with a correct color, **Column 1, Lines 21-31 and Column 2, Lines 36-44 of Bawolek et al.***

*Aratani and Bawolek et al. discuss a processor configured to combine at least a portion of the images with each other as discussed above. However, neither reference discloses doing so using an averaging method for each pixel to be combined to produce an image with an enhanced image quality. Weldy et al. disclose a multi-lens image pickup apparatus with plural image pickup systems (**Abstract of Weldy et al.**). Weldy et al. disclose combining the images using an averaging method on a pixel by pixel basis, **Page 4, Lines 55-58 of Weldy et al.** It would have been obvious and well-known to*

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one of ordinary skill in the art at the time of the invention to incorporate into the teachings of Aratani and Bawolek et al., the method of combining the images using an averaging method as disclosed by Weldy et al., because this is a standard and well-known way of reducing the effects of deviant pixels in the final enhanced image.

*With regard to **Claim 32**, Aratani discloses a method of creating an image file in an imaging device (Compound eye image-taking system, **Abstract and Figures 1-4**), comprising producing images with a sensor array (Sensor array 7 is divided between the four image capturing apparatus', **Figures 3-4 and Paragraphs 0031-0032; 0038**) and four image capturing apparatus (Aperture stop member 2 (1-4), optical lens array 3 (1-4), light shielding block 4 (1-4) and optical filter 6 (1-4) make up four image capturing apparatus', **Paragraphs 0024-0028 and Figures 3-4**), each apparatus using one lens from a lenslet array (microlenses/ optical lens array 3 (1-4), **Figures 3-4**) and a portion of the sensor array (Looking at **Figure 4**, the sensor array 7 is divided into section 7-1 to 7-4 which are used to produce an electric signal, **Figure 4 and Paragraph 0031**),*

*Aratani discloses that three image capturing apparatus being configured to produce an image (Three of the image capturing apparatus' are capable of producing an image, **Paragraphs 0034-0036**). However, Aratani does not explicitly disclose that the three images captured are color images. Official notice is taken by the examiner on stating that it would have been obvious to enable the three image capturing apparatus' disclosed by Aratani with the ability to capture color images. It would have been obvious*

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and well-known to one of ordinary skill in the art at the time of the invention to enable the image capturing apparatus' discussed by Aratani with the ability to capture color images, because color images help people to relate to the images in an improved way since people for the most part view their surroundings in color.

*Although Aratani discloses the fourth image capturing device as discussed above, the reference does not explicitly disclose that the fourth image capturing apparatus is configured to produce an infra-red image. Bawolek et al. disclose an imaging system that uses an imaging array with four types of pixel sensors. Three color types (RGB) with the fourth being an IR type, **Column 3, Line 23 to Column 4, Line 3 of Bawolek et al.** It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to enable the fourth image capturing apparatus disclosed by Aratani with the ability to capture an IR image as disclosed by Bawolek et al., because this helps reduce the effect of IR upon an image signal by subtracting signals generated by the IR pixel sensor from the signals generated by pixel sensors responsive to both IR and visible light and this helps in producing an image with a correct color, **Column 1, Lines 21-31 and Column 2, Lines 36-44 of Bawolek et al.***

Aratani and Bawolek et al. discuss a processor configured to combine at least a portion of the images with each other as discussed above. However, neither reference discloses doing so using an averaging method for each pixel to be combined to produce an image with an enhanced image quality. Weldy et al. disclose a multi-lens image

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*pickup apparatus with plural image pickup systems (**Abstract of Weldy et al.**). Weldy et al. disclose combining the images using an averaging method on a pixel by pixel basis, **Page 4, Lines 55-58 of Weldy et al.** It would have been obvious and well-known to one of ordinary skill in the art at the time of the invention to incorporate into the teachings of Aratani and Bawolek et al., the method of combining the images using an averaging method as disclosed by Weldy et al., because this is a standard and well-known way of reducing the effects of deviant pixels in the final enhanced image.*

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PRITHAM PRABHAKHER whose telephone number is (571)270-1128. The examiner can normally be reached on M-F (7:30-5:00) Alt Friday's Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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